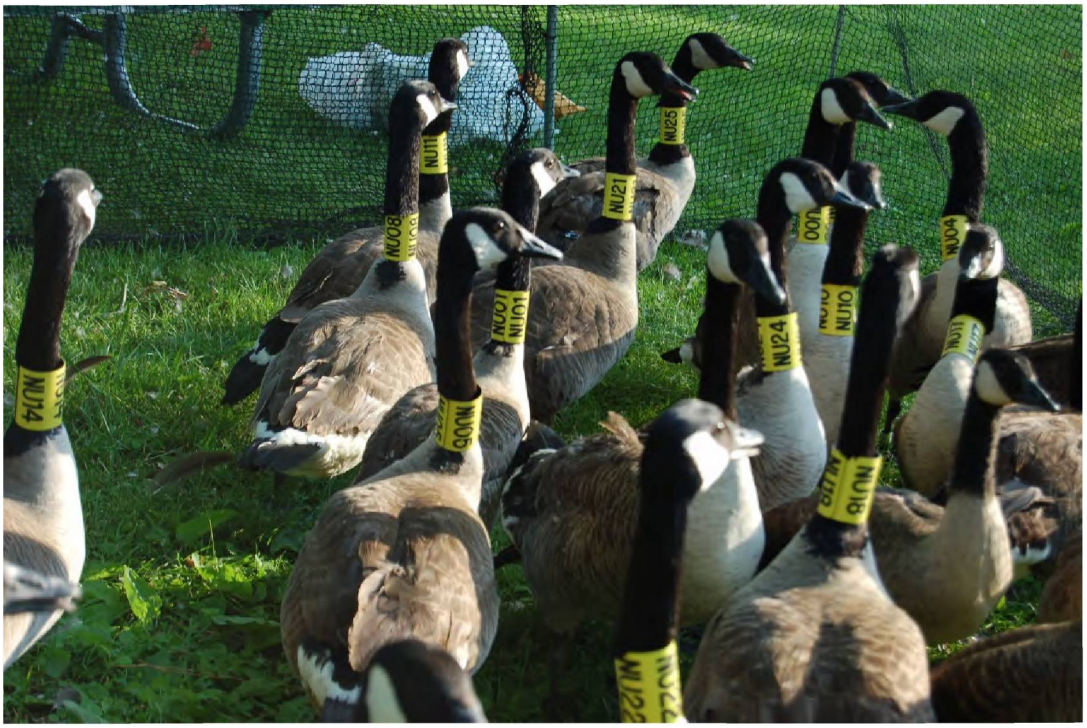
Report to the New York State Community Integrated Pest Management Program

1. **Title: Evaluating and Mitigating Canada Goose Impacts to Parks, Schools, and Golf Courses**



2. **Project Leader(s):**

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3. **Cooperator(s):**

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Jeanne Grace, City Forester, Ithaca, NY
Rick Manning, Friends of Stewart Park

4. Abstract:

Canada goose conflicts in suburban areas of NYS have been increasing based on a recent IPM survey of school districts. Communities continue to search for non-lethal ways to manage geese, as many urban flocks are not easily hunted. We explored a novel method using hobby aircraft (a drone) to disperse problem goose flocks. We also implemented goose fecal transects on turf grass areas at a local park, along with distributing educational fliers to recreational users of these sites. The drone was ineffective for hazing geese from turf grass areas at the park. We then tried a combination of a remote-controlled vehicle (RCV) along with pyrotechnics (bird bangers) to disperse goose flocks. The RCV was very effective in open turf areas and athletic fields. Pyrotechnics were also effective for hazing geese from both turf grass and water areas near the park and golf course. However, we were unable to break site fidelity of the goose flocks, as they sought refuge on the inlet canal for Cayuga Lake where we could not effectively haze the birds. Fecal counts along transects declined over time, but it was unclear if this was due to our hazing efforts, or routine movements of geese away from the park as the summer progressed.

5. Background and Justification:

Canada geese (*Branta canadensis*) are an increasing problem in many public places such as parks, athletic fields, and golf courses. As a large bird that gathers easily in flocks, their presence can become a major issue for landowners and users. The amount of feces left behind by an area's goose population can be an annoyance and a potential health issue. Canada geese typically use multiple locations in a day to forage, rest, and roost. During molt, however, geese become flightless and therefore may rely on one particular location in which to spend about four to six weeks. Typically, they will choose an area with good grazing (i.e., open grassy areas) near water, where geese are more protected from predators (Smith et al. 1998).

Stewart Park in Ithaca, New York, is a park with open turf grass surrounded on three sides by water. Because of this, it is a popular spot for feeding, molting, breeding, and goose activity. This municipal park is used widely by Ithaca residents, with many athletic fields. Over recent years, there has been an issue with human-goose conflicts in the park, both from direct contact, and the feces that the geese leave behind.

There is a great need for goose management in Stewart Park and the surrounding areas. After the molt ends, geese tend to move around and use multiple land spaces throughout the day. A multi-pronged,

mobile approach is the best way to manage geese around the Ithaca area. With the right tools, managers could adapt their management practices to where the largest number of geese are, and/or most severe issues arise. A demonstration project took place in Rochester, New York, testing several different methods for deterring geese (Braband et al. 2016). They utilized remote-controlled vehicles, lasers, dogs, pyrotechnics, air dancers, and several other techniques to deter geese from school grounds. Prior research by Cornell University showed the most success with trained dogs harassing geese during the day, and using lasers at night (Holevinski et al. 2007). Given current resources and feasibility, utilization of dogs may be difficult, expensive, and time consuming in Stewart Park. We aimed to test the efficacy of quadcopters, or drones, as a novel approach to keeping geese out of Stewart Park. This technique is mobile and adaptable, a key component to handling the geese living in and around Ithaca. The goal of this pilot study was to evaluate potential strategies and potentially introduce new methods to control goose populations in Ithaca, and reduce their negative impacts to maintain child-safe playing areas and athletic fields.

6. Objectives:

1. Conduct counts of geese and goslings using the community park, golf course, and school athletic grounds in north Ithaca, NY.
2. Conduct field trials using a motorized aircraft (a drone) to harass geese.
3. Band and color mark local goose flocks to determine movement patterns.
4. Conduct fecal counts on transects to determine changes before and after field trials.
5. Conduct public education at the community park and golf course.
6. Project evaluation via public questionnaire of park and golf course users.

7. Procedures:

Adult and Juvenile Banding

In collaboration with the New York State Department of Environmental Conservation (DEC), we banded flightless geese on June 20th in Stewart Park. All geese were fitted with an aluminum U.S. Fish and Wildlife Service leg band. A subset of these geese were also fitted with yellow plastic neck collars (adults; Figure 1) or red tarsal bands (juvenile; Figure 2). Yellow neck collars and red leg bands were used to allow us to observe local movements of these marked geese in and around Ithaca. These color markers also encouraged people to report tagged geese when they left the Ithaca area.

A brochure was created to alert park users of this banding event, as well as request observations of collared/ banded geese outside of Stewart Park (Figure 3a, 3b). The Cayuga Bird Club and Ithaca City Hall were also alerted to this DEC goose-banding event, and the potential for observing and reporting marked geese.

Goose Abundance Counts

A count of Canada geese present in and near Stewart Park was conducted at least twice a week during July 15 through September 15, 2016. These counts were done by sight with binoculars, and double-checked. The relative location of the geese in and around the park was also noted. The number of visible yellow neck collars and red leg bands was recorded. If it was possible to positively decipher, the letter/number combinations of the collars or leg bands were noted as well. Beginning in mid-August, counts were also completed in and around Cass Park.

Fecal Count Transects

Fecal counts were conducted on four different transects once a week for the duration of the study. Transects were positioned where primary goose activity was noted. Each transect consisted of 25, 1-m^2 plots along a 100-m^2 line. Within each square meter, the number of fresh fecal deposits was recorded. Guidelines for "fresh" feces were pre-established among researchers in order to obtain consistent data throughout the study. The first transect was located along the northern part of the park, right along the south shore of Cayuga Lake. The second and third transects were located in the athletic field in the western part of the park, and the fourth was along the bank of the Six Mile Creek inlet.

Deterrent Trials

The goal of deterrent use was to have the Canada geese become agitated enough to take flight, and ultimately, leave the park. A lightweight, motorized drone was utilized to harass geese in and around Stewart Park. The Traxxas Aton Plus Quadcopter was chosen based on its ease of use and price point around $400 (Figure 4).

Once goose counts were conducted, the drone was flown as close to geese groups as possible without direct contact. In order to increase goose response to the drone, and safely get closer, a small weight on a string was added and hung below the aircraft.

Beginning in late August, a remote-controlled vehicle (RCV) was used to maximize hazing efforts. During times with low numbers of park visitors (mostly early mornings), pyrotechnics (hand-launched

firecrackers) were also used to harass geese away from Stewart and Cass Parks. A laser gun was used several times in order to reinforce these efforts. Use of all deterrents increased significantly in the week leading up to the beginning of the early goose hunting season on September 1, 2016.

8. Results and Discussion:

Adult and Juvenile Banding

We assisted DEC staff and banded 431 Canada geese at Stewart Park in Ithaca, New York, on June 20th, 2016. All geese were marked with a U.S. Fish and Wildlife Service aluminum leg band. Of these geese, a subset of 199 adult geese were marked with yellow neck collars with black letter/numbers, and 61 juveniles (hatching-year) were marked with red plastic leg bands with white letters. There were probably <450 total geese in the park at this time, as only about a dozen geese avoided capture attempts and escaped the net.

Deterrent Methods

The quadcopter was flown on several different occasions over the first three weeks of the study. There was limited success in getting the geese to take flight. Most geese responded by vocalizing and moving further away from the drone on the ground. Even with the added string and weight below the drone, there was a limited response. Additionally, it was difficult to maneuver around obstacles in the park (e.g., the playground equipment), where the geese would remain. The drone was utilized for a total of two to three weeks during mid-summer. Given the goal of the project to move geese out of Stewart Park, we decided to explore other deterrent techniques in order to evaluate more successful management strategies.

The limited hazing success with the drone led researchers to test other deterrent methods. We attempted using a bird-control laser on the geese at Stewart Park. This method can only be used near dawn or dusk because of low light requirements. At dusk, we found that when it was dark enough to use the laser device, the roosting geese were too far away from the shore of Stewart Park to be effective. Additionally, there were often many visitors still in the park, and lasers should only be used with few people present.

Based on an IPM demonstration project (Braband 2016) in Rochester, New York, we utilized a remote-controlled vehicle (RVC) to chase the geese around the park and athletic fields. This method was fairly successful for getting the geese to take flight and depart, either into the water, to other parts of the park, or exit the area altogether. We increased the use of the RVC through the end of the project in Stewart Park, as well as using it occasionally on the geese in nearby Cass Park. Every time we utilized the RCV, we were able to get all of the geese to take flight and leave the targeted land area. If possible given the time

of day and constraints of visitor presence, we followed up with pyrotechnics ("bird bangers") to get the geese to leave the entire park vicinity. These are blank fireworks fired from a small starter pistol. Again, these could only be used when there were minimal park visitors. When used, these were very effective for scaring geese and getting them to take flight. Geese were more apt to take flight when on land than in the water, however with persistence, we were able to get the birds to completely leave the park.

Most days from mid-August through mid-September, we used the RVC to scare the Canada geese off of the park lawns, flushing them into the surrounding water, and then used the firecrackers to scare the birds out of the immediate vicinity. Towards the last few weeks of the project, we harassed geese in both Stewart and Cass Parks. Because of frequent golfer activity, we were not able to harass geese on the Newman Golf Course side of the inlet.

Goose Presence

Overall, the number of geese in Stewart Park decreased as the summer progressed towards fall (Figure 5). There were fluctuations in counts of geese present during the day as well. More geese were observed in and around Stewart Park in the mornings; also numerous geese roosted on the lake after dusk.

Overall, of our 431 banded Canada geese, 165 have been re-sighted or encountered since release on June 20th. As of November 25, 2016, we received 44 encounters of our banded geese from the U.S. Fish & Wildlife Service (USFWS) Bird Banding Laboratory, including 25 (19 collared) harvested during the 2016 hunting season, and one found dead. Of those banded geese reported, 7 did not have a yellow collar or red leg band, but had only the aluminum USFWS band. Eleven of the re-sightings took place outside of Tompkins County, with the furthest being a bird harvested in Millersburg, Pennsylvania. Throughout the summer, we were able to observe 95 unique, yellow-collared adults, and 42 red-banded juvenile birds within Stewart Park. Additionally, we received observations of 16 unique, yellow-collared geese outside of Stewart Park through personal email communications.

Fecal Transects

The amount of goose feces recorded across the four transects decreased over time (Figure 6). The highest counts of feces per square meter were found along transect 4, which was located right along the bank of the Six Mile Creek inlet. The average amount of droppings ranged from 21 per square meter on the first transect date, down to 1 per square meter on the last. During our first feces count in mid-July, one of our test squares on transect number 4 had 125 droppings/square meter, the highest density recorded. The

amount of droppings gradually declined throughout the season, and this was likely due to a combination of seasonal movements, goose presence, and deterrent efficacy (Figure 5).

The drone was easy to maneuver over open areas. This deterrent method might have higher success in more open areas where geese are not as used to human presence, and therefore may be more easily agitated. Most of the geese in Stewart Park have no fear of humans, bikes, cars, or even horns. Overall, the drone was not successful for deterring geese from Stewart Park in Ithaca.

The combined use of the remote-controlled vehicle and pyrotechnics was successful at scaring Canada geese out of the targeted area, particularly when used several times each day. It is difficult to determine whether these methods would be effective at less frequent intervals, as we used them very intensively.

The amount of geese present in Stewart Park decreased over the course of the summer. At the beginning of the study in June, there was a high number present (approximately 450 geese), which is likely because Stewart Park is an ideal molting location. It is difficult to determine whether the use of our deterrents decreased the goose population more than would have happened with normal seasonal movements after the molt. We were successful in moving birds out of favored locations within the park, but we did not break their site fidelity. When we put pressure on the geese in Stewart Park, they simply moved to Cass Park. Then when we pressured the birds at Cass Park, they moved to the Cayuga Lake inlet canal. This was a safe haven where we couldn't chase the birds with pyrotechnics or by boat.

One of the main constraints in this pilot study was the lack of a control area. Ideally, a paired study would monitor goose presence and droppings along transects in a similar area throughout the summer without the use of deterrents. This may help to determine the relationship between declining goose/dropping presence over time, and whether the deterrent methods had a significant influence on either goose abundance or feces observed.

There was a moderate drought in Ithaca during summer 2016. Although the grass did remain green, there were some spots in the park where the grass dried up. This may also have had an effect on goose use of the park as a food source during late summer. The grass along portions of Six Mile Creek inlet was almost completely denuded, removed by both goose grazing and trampling.

As we worked throughout the summer, we discussed the project with park users and described our research trials. We asked the park users about the presence of geese and feces this year compared to

previous summers. Several individuals mentioned that they noticed fewer geese and droppings in the park than had been present in previous years. Many community members seemed to be supportive of this project, and our goal to reduce goose and droppings presence at Stewart Park in a non-lethal manner.

The City of Ithaca implemented a feeding ban on geese and other waterfowl within the city limits during spring 2016, in order to discourage human-goose interactions and potentially decrease goose numbers and negative impacts. Although the feeding ban was in place, it did not seem to be enforced. There was no signage in and around the park, and when asked, park users seemed to be uninformed. In the future, signage, informational materials, and enforcement may help to decrease the instances of waterfowl feeding in and near the park.

The remote-controlled vehicle was effective at temporarily scaring the geese, however, it requires an operator on the ground most days each week. It was effective in as little as 5- to 10-minute intervals several times each day. Similarly, the pyrotechnics (firecrackers) do not take much time to operate. One major downfall was that park users and the surrounding public may complain about the loud noises associated with the firecrackers.

Given the difficulty and time required to haze geese, an effective means to reduce goose conflicts in Stewart Park may be to discourage birds from settling there to molt. By intensely harassing geese during late May and early June before molting starts, the birds may move elsewhere for the duration of the molting period. This would greatly reduce the amount of geese and droppings in the open turf grass areas. However, there are limitations on harassing geese during nesting season, or geese with flightless young. So the pre-molt harassment must be targeted at geese without young. Given there were only about 60 goose chicks in the park during the June 20th round-up (from likely 10 to 12 local goose nests), it appeared that many geese in the park were non-breeding, sub-adults or molt migrants. Early-season harassment using a remote-controlled vehicle and pyrotechnics, enforcing the feeding ban, and public education may help to reduce both geese and associated fecal matter in Stewart Park in a non-lethal way.

City Park staff could also limit numbers of nesting geese in the area by an aggressive egg treatment program over several summers. The U.S. Fish and Wildlife Service permit for egg oiling or puncturing can easily be obtained online (https://epermits.fws.gov/eRCGR/). Given the relatively low number of goose chicks seen during the banding effort, this does not appear to be a major area for Canada goose nesting. Only a dozen or so nests with eggs may need to be treated each spring to limit reproduction and increase the effectiveness of pre-molt hazing.

If conflicts between Canada geese and park users continue in future years, goose round-ups and removal could be considered as a management approach. This would require community support and public meetings so that stakeholders can share their concerns. Also, permits would be needed from the USFWS and DEC. With sufficient volunteers and appropriate equipment, it is clear from our banding efforts that nearly all the geese in Stewart Park could be captured in a single round-up effort. There are relatively few other geese along the Inlet Canal near State Route 79 during the molting period, so two round-ups could quickly and efficiently lower goose numbers throughout the City of Ithaca if that is what people desire. This could potentially reduce goose numbers and associated conflicts (e.g., droppings, feathers, and over-grazing on turf grass areas) for several years.

9. Project Location: Ithaca, New York

10. Samples of Resources Developed: See Figures 3a. and 3b.

Literature Cited:

Braband, L. 2016. Geese on School Grounds. New York State Integrated Pest Management Program, Cornell University.

Holevinski, R. A., R. A. Malecki, and P. D. Curtis. 2007. Hazing of Canada geese is unlikely to reduce nuisance populations in urban and suburban communities. *Human-Wildlife Conflicts* **1(2)**:257-264.

Smith, A. E., S. R. Craven, and P. D. Curtis. 1998. Managing Canada geese in urban environments. Cornell Cooperative Extension Information Bulletin 243. N.Y. State College of Agriculture and Life Sciences, Cornell University, Ithaca, N.Y. 42pp.

Acknowledgements:

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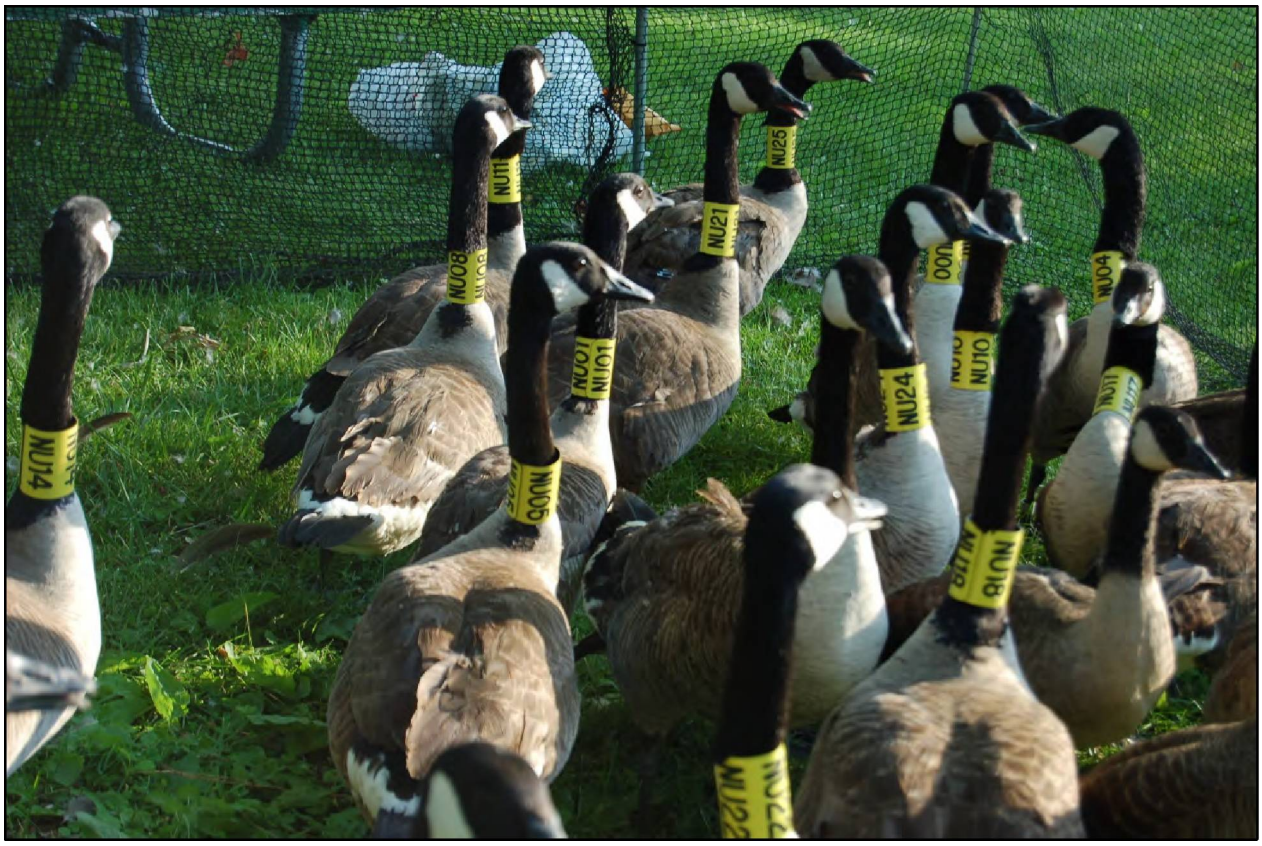

Figure 1: Canada geese banded with yellow, plastic neck collars in Stewart Park, Ithaca, New York on June 20th, 2016.

Figure 2: Juvenile Canada goose banded with red and white, plastic leg band in Stewart Park, Ithaca, New York on June 20th, 2016 (photo credit: L. Braband).

Adult geese with yellow ID collars in Stewart Park

What's with the yellow necklaces?

- Around 430 geese were tagged in late June 2016 in Stewart Park
- All geese were marked with a US Fish & Wildlife Service aluminum leg band
- A sample of 200 adult geese are also wearing yellow neck collars with black numbers and letters
- 60 young (hatching-year) geese were banded with red leg bands with white letters
- Collaring and banding the geese allows DEC and Cornell staff to monitor their movements throughout the City, and aid the City's efforts to more accurately estimate the population size.

Who We Are

The City of Ithaca, New York State Department of Environmental Conservation, and Cornell University, with support from the Friends of Stewart Park, are working to reduce goose conflicts and associated issues in Stewart Park, Ithaca, NY.

Contact Us

Email: **ithacageese@gmail.com**
Web: wp.wildlifecontrol.info

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

GEESE MANAGEMENT IN STEWART PARK

Canada geese around Ithaca, NY

Figure 3a. The outside of the brochure developed for public outreach and education pertaining to geese management in Stewart Park, Ithaca, New York.

Geese in Stewart Park

Stewart Park, here in Ithaca, NY, is a great place for humans and wildlife alike. With open playing fields and the historic Renwick Woods surrounded by water, it is no wonder that so many people and animals are attracted here. Canada geese are abundant and easily seen around the park.

The City of Ithaca, the New York Department of Environmental Conservation, and Cornell University are working together to manage the geese and feces in Stewart Park.

Why this project?

These efforts are in response to multiple complaints from residents largely due to the excessive amount of feces from the current population. The large amount of goose poop has prevented people from being able to use park space, the City golf course, and playing fields.

- The City urges residents and visitors to refrain from approaching any geese, especially those with young.
- Nesting geese or geese with goslings can be aggressive if they feel threatened.

Feeding geese and ducks within the Ithaca city limits is banned.

What's next?

- Cornell staff will be counting geese & testing a novel method to deter the geese away from Stewart Park & the City golf course.
- Our trained scientist will use a novel aircraft in a very specific, controlled manner in order to mitigate any impacts to non-target species.
- These activities will mostly occur during early morning and late evening to minimize disturbance to park users.
- Transects will help determine if this non-lethal management reduces the goose feces and associated problems.
- Results will be used by the City and DEC to continue developing an effective and responsible management plan.

Can I help?

- If you see yellow-collared, or red leg-banded, geese in **areas other than Stewart Park and the City Golf Course** and can read the numbers and letters accurately (typically with binoculars), email: **ithacageese@gmail.com** with the subject heading "Goose observation" and the numbers, date, time and location of the bird.
- Any other questions can also be directed here.

Figure 3b. The inside of the brochure developed for public outreach and education pertaining to geese management in Stewart Park, Ithaca, New York.

Figure 4: The Traxxas Aton Plus Quadcopter model that was used to haze geese in a study in Stewart Park, Ithaca, New York during late summer 2016 (photo credit: L. Braband).

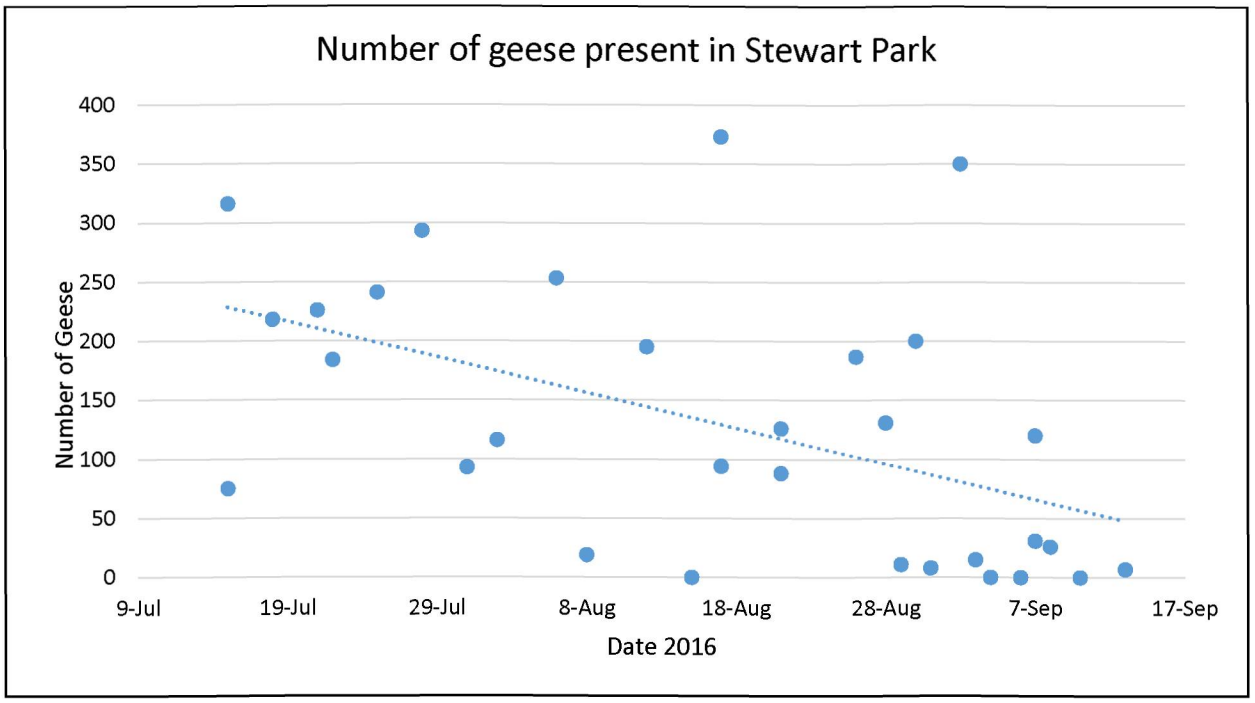

Figure 5: The number of Canada geese present in Stewart Park, Ithaca, New York during summer 2016.

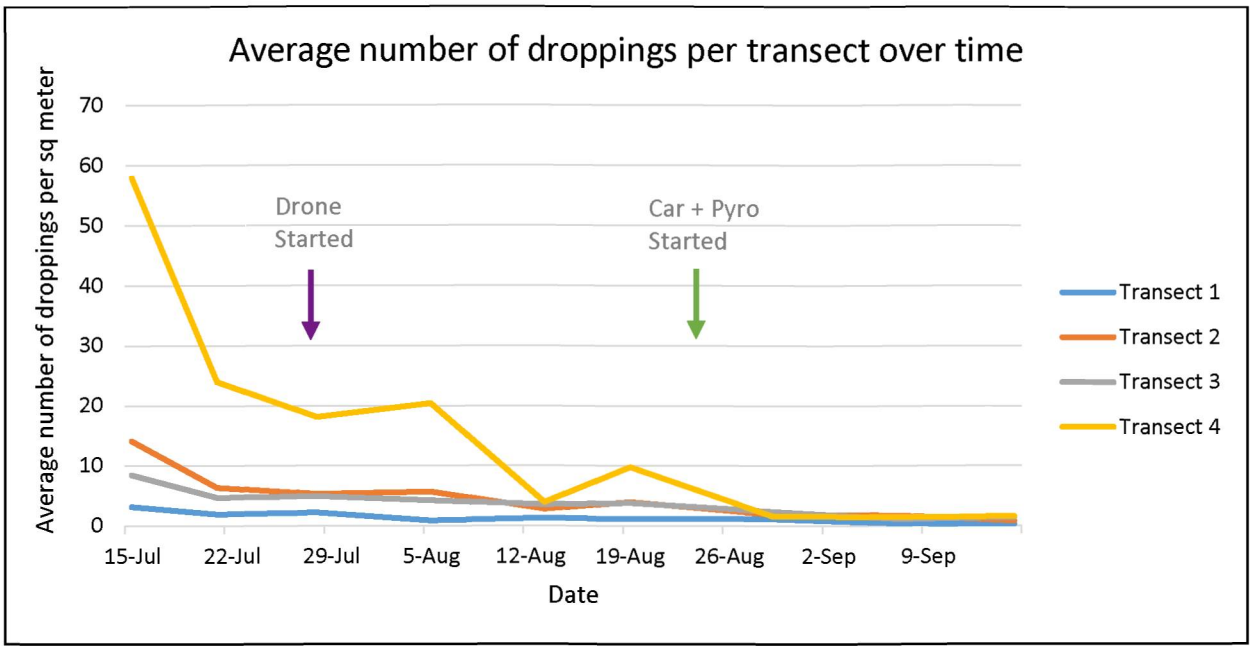

Figure 6: Number of droppings found in four transects in Stewart Park, Ithaca, New York, during summer 2016. Arrows are used to show the two dates when deterrent techniques were applied.